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20985	7590	05/01/2006	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/776,645

Applicant(s)

KINDEM ET AL.

Examiner

Shun Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2006 and 18 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-14 and 16-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-14 and 16-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 March 2006 has been entered.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claims 13, 14, 17, 19, 24, 36, 37, 40, 43, 50, and 51 are objected to because of the following informalities:

- (a) in claim 13, "at least one pixel has at least one exit window" on line 2 should probably be --said first shape has an exit window-- (since "at least one" does not appear to further limit "each having outer surfaces of a first shape" as recited in amended independent claim 1);
- (b) in claim 14, "one or a plurality of said scintillator material, forming scintillator pixels is, shaped" on line 2 should probably be --said first shape is-- (since "one or a

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- plurality" does not appear to further limit "each having outer surfaces of a first shape" as recited in amended independent claim 1);
- (c) in claim 17, "at least one of said scintillator material" on line 2 should probably be --said first shape-- (since "at least one" does not appear to further limit "each having outer surfaces of a first shape" as recited in amended independent claim 1);
- (d) in claim 19, "the reflector assembly" on line 2 should probably be --said preformed reflector--;
- (e) in claim 24, "said pre-formed reflector assembly" on lines 3-4 should probably be --said preformed reflector--;
- (f) in claim 36, "the pre-formed reflector assembly" on line 2 should probably be --said preformed reflector--;
- (g) in claim 37, "each pixel ... said array" on lines 7-8 should probably be --each of said separated pixels ... said reflector array-- (to avoid confusion with "individual pixels" on lines 2-3 in claim 37 and "array of scintillator material" on lines 5-6 in claim 37);
- (h) in claim 40, "said performing" on line 2 should probably be --said pre-forming step--;
- (i) in claim 43, "a plurality of separate units" on lines 2 should probably be --said separated pixels--;
- (j) in claim 50, "at least one of said scintillator pixels" on lines 2-3 should probably be --said first shape-- (since "at least one" does not appear to further limit "each

having outer surfaces of a first shape" as recited in amended independent claim 1); and

(k) in claim 51, "said pixel" on line 3 should probably be --said separated pixel--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 9, 10, 22, and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9, 10, 22, and 23 are directly or indirectly dependent on a canceled base claim. Therefore, the claims are incomplete and fail to particularly point out and distinctly claim the subject matter which applicant regards as the invention (MPEP § 608.01(n)).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

7. Claims 1, 3, 5, 6, 11, 24, 25, 37, 39-41, 43, 45-47, and 51 are rejected under 35 U.S.C. 102(a) as being anticipated by Freund *et al.* (WO 02/25311 A1).

It should be noted that US Patent 6,894,282 B2 (Freund *et al.*) corresponds to WO 02/25311 A1 (Freund *et al.*).

In regard to claim 1, Freund *et al.* disclose (Figs. 5 and 6) a scintillator assembly, comprising:

- (a) an array of scintillator material comprising plural pixels (4) of separated scintillator material, each having outer surfaces of a first shape, and a bridge (*i.e.*, "base plate"; US 6,894,282 column 4, lines 57-66) holding together the plural separated pixels (4) in a specific geometry; and
- (b) a preformed reflector (5), having plural inner surfaces which each mate with said array of plural separated pixels (4), to contain each of said pixels (4) of scintillator material at least partly within said pre-formed reflector (5).

In regard to claim 37, Freund *et al.* disclose (Figs. 5 and 6) a method, comprising:

- (a) pre-forming a reflector array (5) having plural individual pixels, each of a specified shape having specified shaped inner surfaces; and
- (b) attaching said reflector (5) to an array of scintillator material formed of separated pixels (4) of scintillator material that are held together, each pixel shaped to fit within one of said individual pixels of said array (5).

In regard to claim 3 (which is dependent on claim 1) and claim 39 (which is dependent on claim 37), Freund *et al.* also disclose (US 6,894,282 column 4, line 66 to column 5, line 10) an adhesive material, bonding said scintillator material within said pre-formed reflector.

In regard to claims **5** and **6** (which are dependent on claim 1) and claims **40** and **41** (which are dependent on claim 37), Freund *et al.* also disclose (Figs. 5 and 6) an opening in the preformed reflector (5), at a specified location, corresponding to a specified location on the scintillator material, wherein said opening is at a location of an exit window on the scintillator material.

In regard to claim **11** which is dependent on claim 1, Freund *et al.* also disclose (Figs. 5 and 6) a plurality of openings in the pre-formed reflector (5), at locations of a plurality of exit faces for the scintillator material.

In regard to claims **24** and **25** (which are dependent on claim 1), Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) at least one of inorganic or organic materials such as titanium dioxide as an additive to the reflector material of a pre-formed reflector.

In regard to claim **43** which is dependent on claim 37, Freund *et al.* also disclose (Figs. 5 and 6) that said reflector (5) has a specified shape to hold a plurality of separate units of scintillator material.

In regard to claim **45** (which is dependent on claim 1) and claim **47** (which is dependent on claim 37), Freund *et al.* also disclose (Figs. 5 and 6) that the preformed reflector (5) has a plurality of continuous surfaces which extend from a first portion on the scintillator material near a first end thereof, to a second portion on the scintillator material near a second opposite end thereof, and continuously extends between said first and second portions.

In regard to claim **46** which is dependent on claim 37, Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) using said reflector to reflect scintillation photons back into said scintillator material.

In regard to claim **51** which is dependent on claim 1, Freund *et al.* also disclose (Figs. 5 and 6) that said preformed reflector (5) has, for each pixel, four completely solid walls, completely surrounding walls of said pixel.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 2, 4, 12, 19, 38, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Such *et al.* (US 2001/0002699).

In regard to claims **2** and **4** (which are dependent on claim 1), claim **12** (which is dependent on claim 1), claim **19** (which is dependent on claim 1), claim **38** (which is dependent on claim 37), and claim **44** (which is dependent on claim 43), the assembly and method of Freund *et al.* lacks that the pre-formed reflector is formed of multiple flexible pieces with ridges within said preformed reflector, wherein said inner surfaces of said pre-formed reflector press against outer surfaces of said scintillator material to hold said scintillator material within said preformed reflector with at least one air gap between adjacent scintillator material surfaces by press fitting. Such *et al.* teach (paragraphs 8 and 12; Fig. 2) to press fit scintillator material (23) into a preformed reflector (21, 22) having ridges or protrusions (*i.e.*, spaced apart wire elements; paragraph 9) forming air gaps, in order to manufacture with a high precision and in large numbers at an acceptable cost. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to form the reflector in the assembly and method of Freund *et al.* from spaced apart wire elements which allows press fitting assembly, in order to manufacture with a high precision and in large numbers at an acceptable cost.

11. Claims 7, 20, 21, 29, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiFilippo (US 6,078,052).

In regard to claim **7** (which is dependent on claim 5), claims **20** and **21** (which are dependent on claim 1), and claim **42** (which is dependent on claim 40), the assembly and method of Freund *et al.* lacks a light guide (*e.g.*, a wavelength shifting optical fiber). However, wavelength shifting optical fibers are well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting

optical fibers in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide wavelength shifting optical fibers in the assembly and method of Freund *et al.*, in order to enhance collection efficiency.

In regard to claim **29** which is dependent on claim 1, the assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (e.g., organic optical brightening agents). However, wavelength shifting is well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers (i.e., organic optical brightening agents) in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide organic optical brightening agents (e.g., wavelength shifting optical fibers) in the assembly of Freund *et al.*, in order to enhance collection efficiency.

12. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227).

In regard to claims **9** and **10** which are dependent on claim 1 in so far as understood, the assembly of Freund *et al.* lacks providing at least one air gap between a wall of the reflector and a surface of the scintillator material with a spacer formed by a protrusion. DiBianca *et al.* teach (column 5, lines 9-34) to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material (100 in Fig. 5), in order to enhance light collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the

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invention to provide at least one air gap between a wall of the reflector and a surface of the scintillator material with a bonding material as a spacer in the assembly of Freund *et al.*, in order to enhance light collection efficiency.

13. Claims 13, 14, 17, 18, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Possin *et al.* (US 6,707,046).

In regard to claims **13** and **50** (which are dependent on claim 1), claim **14** (which is dependent on claim 1), claim **17** (which is dependent on claim 1), and claim **18** (which is dependent on claim 1), the assembly of Freund *et al.* lacks that at least one pixel has at least one exit window smaller than the area of a face of the pixel upon which each said exit window is defined, wherein at least one of said scintillator pixels is shaped other than a rectangular parallelepiped with at least one exit face that is not perpendicular to adjacent sidewalls of the material and varies in cross-sectional area in at least one direction by having a first portion at one end which is substantially constant and rectangular in cross section, and having a second end which reduces in area between said substantially constant cross-section and an end section which forms an exit window of the scintillator material. However, scintillator exit windows are well known in the art. For example, Possin *et al.* teach (column 5, line 65 to column 6, line 54) to provide scintillator exit windows smaller than the area of a pixel face so as minimize cross talk. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator exit windows smaller than the area of a pixel face in the assembly of Freund *et al.*, in order to minimize cross talk.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Hoffman *et al.* (US 6,087,665).

In regard to claim **16** which is dependent on claim 1, the assembly of Freund *et al.* lacks that the scintillator material comprises different scintillator materials. However, scintillator detectors are well known in the art. For example, Hoffman *et al.* teach (column 4, lines 28-33) to provide different scintillator materials so as optimize specific detector characteristics. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide different scintillator materials in the assembly of Freund *et al.*, in order to optimize specific detector characteristics.

15. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) as applied to claim 9 above, and further in view of DiFilippo (US 6,078,052).

In regard to claims **22** and **23** which are dependent on claim 9 in so far as understood, the assembly of Freund *et al.* lacks a light guide (e.g., a wavelength shifting optical fiber). However, wavelength shifting optical fibers are well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide wavelength shifting optical fibers in the assembly of Freund *et al.*, in order to enhance collection efficiency.

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16. Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Venkataramani *et al.* (US 2002/0181647).

In regard to claims **26** and **27** which are dependent on claim 24, the assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (e.g., hafnium or hafnium oxide). However, additives for scintillator reflectors are well known in the art. For example, Venkataramani *et al.* teach (paragraphs 27-31) to provide scintillator reflector additives such as hafnium or hafnium oxide so as to obtain scintillator reflectors having desired x-ray attenuation properties. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide scintillator reflector additives (e.g., hafnium or hafnium oxide) in the assembly of Freund *et al.*, in order to obtain a scintillator reflector having desired properties (e.g., attenuation of x-rays).

17. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Hoffman (US 6,479,824).

In regard to claim **28** which is dependent on claim 24, the assembly of Freund *et al.* lacks an explicit description of specific reflector fillers or additives (e.g., scintillating material). However, additives for scintillator reflectors are well known in the art. For example, Hoffman teaches (column 4, line 55 to column 5, line 2) to provide scintillating material for the reflector fillers or additives so as enhance quantum efficiency. Therefore it would have been obvious to one having ordinary skill in the art

at the time of the invention to provide scintillator reflector additives (e.g., scintillating material) in the assembly of Freund *et al.*, in order to enhance quantum efficiency.

18. Claims 30, 31, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300).

In regard to claim **30** which is dependent on claim 1, the assembly of Freund *et al.* lacks an explicit description of that the plastic reflector (US 6,894,282 column 2, lines 58-65) comprises polyethylene. However, plastics are well known in the art. For example, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention that the unspecified plastic reflector material in the assembly of Freund *et al.* comprises a known plastic material (e.g., polyethylene).

In regard to claim **31** which is dependent on claim 30, Freund *et al.* is applied as in claim 25 above.

In regard to claim **36** which is dependent on claim 30, Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) that the pre-formed reflector assembly is formed by injection molding.

19. Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 30 above, and further in view of Venkataramani *et al.* (US 2002/0181647).

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In regard to claims **32** and **33** which are dependent on claim 30, Venkataramani *et al.* is applied as in claims 26 and 27 above.

20. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 30 above, and further in view of Hoffman (US 6,479,824).

In regard to claim **34** which is dependent on claim 30, Hoffman is applied as in claim 28 above.

21. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) as applied to claim 30 above, and further in view of DiFilippo (US 6,078,052).

In regard to claim **35** which is dependent on claim 30, DiFilippo is applied as in claim 29 above.

22. Claims 48, 49, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of Venkataramani *et al.* (US 6,361,735).

In regard to claims **48** and **49** (which are dependent on claim 1) and claim **52** (which is dependent on claim 37), the assembly and method of Freund *et al.* lacks that said array of scintillator material which is held together by said bridge is a two-dimensional array (e.g., a 4X4 array). Venkataramani *et al.* teach (column 3, line 14 to column 4, line 64) that an array of scintillator material for a CT scanning system can be formed as a one dimension array or a two dimensional array. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to form

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the array of scintillator material in the assembly and method of Freund *et al.* as a two-dimensional array (e.g., a 4X4 array), in order to achieve a desired type of CT scanning system.

Response to Arguments

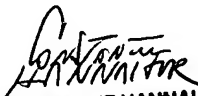
23. Applicant's arguments with respect to amended independent claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CONSTANTINE HANNAHER
PRIMARY EXAMINER

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